Space Weather Forecast

Issued on Thursday, 23 February 2023 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity likely throughout (Minor/Moderate R1/R2 radio blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate with three low Moderate-class flares in the last 24 hours. There are now five sunspot regions on the visible disc. Three of which pose a flare risk and all located n the eastern hemisphere and are approaching the central meridian.

Currently no significant Earth-directed coronal mass ejections are forecast, although glancing impacts may occur on Thursday and Saturday.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of the arrival of the fast wind from coronal hole 77. The wind speed increased from Slightly Elevated to Elevated between 22/2330-23/0200 UTC. The interplanetary magnetic field has been at mostly Moderate levels. The north-south component followed a steady weak negative trend until 22/1900 UTC, after which it varied sporadically between +8/-10 nT. Geomagnetic activity was mainly Quiet to Unsettled (Kp 2-3), with one Active interval between 23/0000-0300 UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate solar activity is likely to continue, with a slight chance of High activity. Three of the five regions on the disc present a flare risk, all of which should be present throughout the coming four days.

Solar Wind / Geomagnetic Activity: There are two low confidence coronal mass ejections in the forecast, one perhaps arriving on the 23rd and another on the 25th. Otherwise, Earth is experiencing the fast wind from coronal hole 77, but this is likely to have only minor impacts and should gradually wane through 23 Feb. A further coronal hole 78, is located well south on the visible disc but may give Earth a high speed stream during 25 Feb with winds perhaps reaching elevated levels.

Geomagnetic activity is expected to be mostly Quiet to Unsettled, but with a chance of active intervals throughout, and a slight chance of G1/Minor Storms on 25 Feb due to a combination of coronal hole fast winds and coronal mass ejection glancing blows.

Energetic Particles / Solar Radiation: Solar radiation carries a slowly increasing slight chance of rising towards the S1 level, should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	60	60
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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